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FINAL REPORT

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Earth Science and Applications Division

Entitled:

ON THE COUPLING OF SATELLITE SURFACE CLIMATOLOGY PARAMETERS WITH GROUND TRUTH

Submitted to:

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(NASA-CR-194321) ON THE COUPLING
OF SATELLITE SURFACE CLIMATOLOGY
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Report, 1 Oct. 1986 - 30 Sep. 1987
(Maryland Univ.) 3 p

N94-70090

Unclas

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Objectives:

The objectives of the proposed study were:

- assess the effect of sub-grid scale heterogeneity of land surface properties on the validation of surface radiation budgets as derived from satellites;
- quantify the annual variability of the surface boundary conditions, detected by polar orbiting satellites.

Results

The first objective was addressed in the two enclosed manuscripts.

- Pinker and Stowe (1990) have shown that while surface anisotropy at sub-grid scale is a well established feature, at the scale of low-resolution satellite observations it might not be necessary to account for it.
- Pinker and Laszlo (1990) have shown that satellite methods for deriving insolation can be improved on regional scale (sub-grid scale), beyond what is achievable on larger scale, if a realistic surface albedo model is used.

The steps to be taken to achieve the second objective are:

- aggregation and re-mapping of long term data over same terrain;
- cloud elimination and creation of a clear sky data base;
- computation of surface net radiation, albedo, surface temperature and vegetation index.

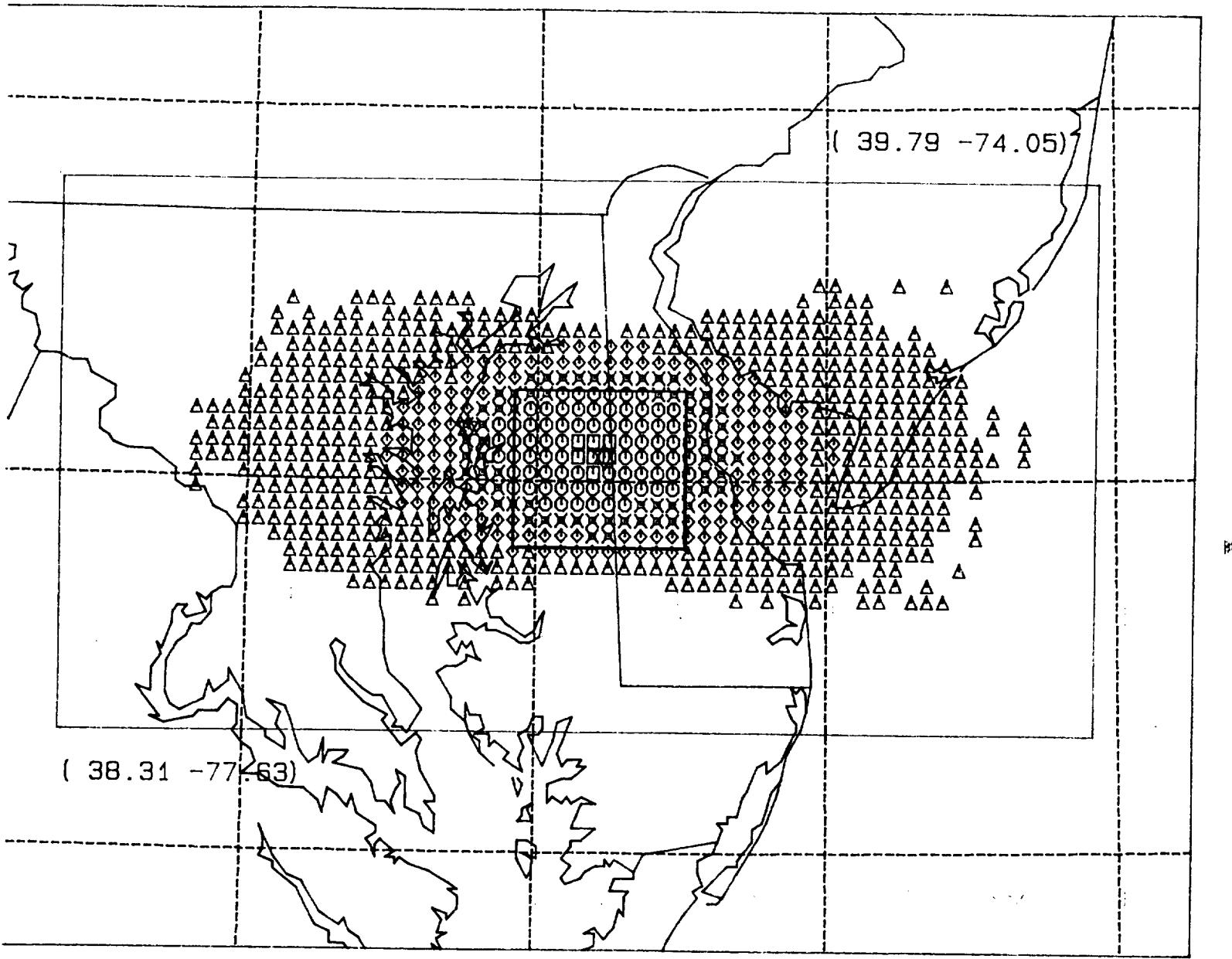
For long term monitoring of the same sites we used GAC data from NOAA-7 in the form of one GAC target which is comprised of 11 x 11 GAC pixels. We have completed the re-mapping of the long term time series over several locations, as illustrated for Delmarva, MD (centered at: 39.139° N; 76.129° W) in Fig. 1. We have also developed a cloud screening method to derive a cloud free data base. The surface parameters were, as yet, not computed for an annual cycle.

Additional information can be found in two semi-annual reports covering periods:

10/1/86 – 3/31/87
4/1/87 – 9/30/87

that were submitted to the NASA/GSFC Grants Managing Office.

Distribution Map for DELMARVA data set (3/84 - 8/85)



SYMBOLS: Δ \diamond \times \bigcirc \square
 COLORS : BLUE BROWN GREEN ORANGE VIOLET
 DENSITY: 11-100 101-300 301-500 501-1000 > 1000

CITY 1 & 2 (39.139 -76.239) (39.067 -75.767)

Total records: 1127 Distribution Matrix: 35 X 65

Figure 1.